

that is from the even breaking off of the stick, the solid *interstitia* having a regular termination or surface, and having a pretty strong reflecting quality, the many small reflections become united to the naked eye, and make a very pretty shining surface.

Thirdly, the reason of its hardness and brittleness seems evident, for since all the watery or liquid substance that moistn'd and toughn'd those *Interstitia* of the more solid parts, are evaporated and remov'd, that which is left behind becomes of the nature almost of a stone, which will not at all, or very little, bend without a *divulsion* or *solution* of its continuity.

It is not my design at present, to examine the use and *Mechanisme* of these parts of Wood, that being more proper to another Enquiry; but rather to hint, that from this Experiment we may learn,

First, what is the cause of the blackness of many burnt bodies, which we may find to be nothing else but this; that the heat of the fire agitating and rarifying the waterish, transparent, and volatile water that is contain'd in them, by the continuation of that action, does so totally expel and drive away all that which before fill'd the pores, and was dispers'd also through the solid mass of it, and thereby caus'd an universal kind of transparency, that it not onely leaves all the pores empty, but all the *Interstitia* also so dry and *opacous*, and perhaps also yet further perforated, that that light onely is reflected back which falls upon the very outward edges of the pores, all they that enter into the pores of the body, never returning, but being lost in it.

Now, that the Charring or coaling of a body is nothing else, may be easily believ'd by one that shall consider the means of its production, which may be done after this, or any such manner. The body to be charr'd or coal'd, may be put into a *Crucible*, Pot, or any other Vessel that will endure to be made red-hot in the Fire without breaking, and then cover'd over with Sand, so as no part of it be suffer'd to be open to the Air, then set into a good Fire, and there kept till the Sand has continu'd red hot for a quarter, half, an hour or two, or more, according to the nature and bigness of the body to be coal'd or charr'd, then taking it out of the Fire, and letting it stand till it be quite cold, the body may be taken out of the Sand well charr'd and cleans'd of its waterish parts; but in the taking of it out, care must be had that the Sand be very neer cold, for else, when it comes into the free air, it will take fire, and readily burn away.

This may be done also in any close Vessel of Glass, as a *Retort*, or the like, and the several fluid substances that come over may be receiv'd in a fit *Recipient*, which will yet further countenance this *Hypothesis*: And their manner of charring Wood in great quantity comes much to the same thing, namely, an application of a great heat to the body, and preserving it from the free access of the devouring air; this may be easily learn'd from the History of Charring of Coal, most excellently describ'd and publish'd by that most accomplish'd Gentleman, Mr. John Evelyn, in the 100, 101, 103, pages of his *Sylva*, to which I shall therefore refer the curious Reader that desires a full information of it.

Next

Next, we may learn what part of the Wood it is that is the matter; for since we shall find that none, or very little, of the stances that are driven over into the Receiver are of the Wood, most of that which is left behind is so, it follows, that the parts of the Wood are the *combustible* matter. Further, charr'd Wood burns with a greater flame than that which is not charr'd, evident, because those waterish or volatile parts issue out of the Wood, every way, not onely shatter and open the body to the fire to enter, but issuing out in vapours or winds, they do so many little *aeolipiles*, or Bellows, whereby they blow the fir'd part, and conduce to the more speedy and violent dissolution of the body.

Thirdly, from the Experiment of charring of Coal, that notwithstanding the great heat, and the duration of the parts of the Wood remain, whilest they are preserv'd (the Air undissipated) we may learn, that which has been publish'd or hinted, nay, not so much as thought, that in short is this.

First, that the Air in which we live, move, and breathe, compasses very many, and cherishes most bodies it enters; and the Air is the *menstruum*, or universal dissolvent of all substances.

Secondly, that this action it performs not, till the body is sufficiently heated, as we find requisite also to the dissolution of bodies by several other *menstruums*.

Thirdly, that this action of dissolution, produces a great heat, and that which we call Fire; and this is common to all dissolutions of other bodies, made by *menstruums*, of all sorts and multitudes of Instances.

Fourthly, that this action is perform'd with so great a force, that it does so minutely act, and rapidly agitate the small parts of the *combustible* matter, that it produces in the *diaphanous* matter, an action or pulse of light, which what it is, I have elsewhere said.

Fifthly, that the dissolution of sulphureous bodies is not inherent, and mixt with the Air, that is like, if not the same, that which is fixt in *salt-peter*, which by multitudes of Experiments may be made with *salt-peter*, will, I think, most evidently appear.

Sixthly, that in this dissolution of bodies by the Air, the parts are united and mixt, or dissolv'd and turn'd into the Air, and down with it in the same manner as a *metalline* substance dissolv'd into any *menstruum*, does follow the motion of that *menstruum* till it be precipitated.

Seventhly, That as there is one part that is dissolved, there other parts with which the parts of the Air are mixt, do make a *Coagulum*, or *precipitation*, as one may see in the dissolution of *salt-peter*, it to be separated from the Air, but this *precipitation* is so small and rarify'd or porous clusters, that it is very easily carry'd up by the motion of the Air, though afterwards